

CLAIMS

Having thus described the invention, what is claimed is:

1. A bending assembly in a bending machine (1) for bending rod and/or bar-shaped workpieces (8) comprising (a) a bending tool (10) and (b) a bending drive unit (11) including (c) a swivel arm (21) and (ii) a bending-drive motor (22), said bending tool (10) including (i) at least one workpiece thrust block (12, 13) and (ii) at least one thrust pad (17, 18) on the swivel arm (21), said bending-drive motor (22) being operable to rotate the swivel arm (21) with the thrust pad (17, 18) around a bending axis (14) extending in the transverse workpiece direction, whereby the workpiece, forced by the thrust pad (17, 18) against the associated workpiece thrust block (12, 13), can be bent by rotating the swivel arm (21) with the thrust pad (17, 18) around the workpiece thrust block (12, 13), said bending-drive motor (22) having a motor shaft (27) which extends parallel to the bending axis (14) and is drive-connected at both shaft ends (28, 29) to the swivel arm (21).

2. The bending assembly in accordance with Claim 1, wherein the motor shaft (27) of the bending-drive motor (22) extends coaxially with the bending axis (14).

3. The bending assembly in accordance with Claim 1 wherein the bending-drive motor (22) is a torque motor.

4. The bending assembly in accordance with Claim 1 wherein both ends (28, 29) of the motor shaft (27) of the bending-drive motor (22) are individually drive-connected to the swivel arm (21) by a gear unit (23, 24).

5. The bending assembly in accordance with Claim 1 wherein at least one workpiece thrust block (12, 13) of the bending tool (10) is in the form of a bending die and is drive-connected to the motor shaft (27) of the bending-drive motor (22) and can thus be rotated around the bending axis (14), and wherein the bending tool (10) is equipped with at least one thrust pad (17, 18) in the form of a clamping jaw mounted in the transverse workpiece direction on the swivel arm (21), so that the workpiece can be clamped between the bending die and the associated clamping jaw and bent, while clamped, by rotation of the bending die and of the swivel arm with the clamping jaw around the bending die.

6. The bending assembly in accordance with Claim 1 wherein both ends (28, 29) of the motor shaft (27) of the bending-drive motor (22) are respectively drive-connected to at least one bending die which can be rotated around the bending axis (14), the bending dies on the respective shaft ends (28, 29) being positioned in the direction of the bending axis (14) on either side of the bending-drive motor (22), each die cooperating with a clamping jaw that is movable on the swivel arm (21) in the transverse direction of the workpiece, and wherein the bending assembly (3) can be rotated around an axis (30) that extends in the longitudinal direction of the workpiece, whereby one of the bending dies located on either side of the bending-drive motor (22) and its associated clamping jaw can be selectively moved into a working position.

7. A bending assembly in a bending machine (1) for bending rod and/or bar-shaped workpieces (8) comprising (a) a bending tool (10) and (b) a bending drive unit (11) including (c) a swivel arm (21) and (ii) a bending-drive motor (22), said bending tool (10) including (i) at least one workpiece thrust block (12, 13) and, (ii) at least one thrust pad (17, 18) on the swivel arm (21), said bending-drive motor (22) being operable to rotate the swivel arm (21) with the thrust pad (17, 18) around a bending axis (14) extending in the transverse workpiece direction whereby the workpiece, forced by the thrust pad (17, 18) against the associated workpiece thrust block (12, 13), can be bent by rotating the swivel arm (21) with the thrust pad (17, 18) around the workpiece thrust block (12, 13), said bending-drive motor (22) having a motor shaft (27) which extends parallel to the bending axis (14) and is drive-connected at both shaft ends (28, 29) to the swivel arm (21), said bending drive motor (2) being a torque motor and the motor shaft (27) of the bending-drive motor (22) extending coaxially with the bending axis (14).

8. The bending assembly in accordance with Claim 7 wherein both ends (28, 29) of the motor shaft (27) of the bending-drive motor (22) are individually drive-connected to the swivel arm (21) by a gear unit (23, 24).

9. The bending assembly in accordance with Claim 7 wherein at least one workpiece thrust block (12, 13) of the bending tool (10) is in the form of a bending die and is drive-connected to the motor shaft (27) of the bending-drive motor (22) and can thus be rotated around the bending axis (14), and wherein the bending tool (10) is equipped with at least one thrust pad (17, 18) in the form of a clamping jaw mounted in the transverse workpiece direction on the swivel arm (21), so that the workpiece can be clamped between the bending die and the associated clamping jaw and bent, while clamped, by rotation of the bending die and of the swivel arm with the clamping jaw around the bending die.

10. The bending assembly in accordance with Claim 7 wherein both shaft ends (28, 29) of the motor shaft (27) of the bending-drive motor (22) are respectively drive-connected to at least one bending die which can be rotated around the bending axis (14), the bending dies on the respective shaft ends (28, 29) are positioned in the direction of the bending axis (14) on either side of the bending-drive motor (22), each cooperating with a clamping jaw that is movable on the swivel arm (21) in the transverse direction of the workpiece, and wherein the bending assembly (3) can be rotated around an axis (30) that extends in the longitudinal direction of the workpiece, whereby one of the bending dies located on either side of the bending-drive motor (22) and its associated clamping jaw can be selectively moved into a working position.